

III.—*Notes on the Zoology of the Outer Hebrides.* By JOHN MACGILLIVRAY, Vice-President of the Cuvierian Nat. Hist. Society of Edinburgh.

THE only account of the Natural History of the Outer Hebrides that has yet been published is that of Professor MacGillivray*, and it being now upwards of twenty years since that gentleman visited the district, I have been induced to arrange a few notes relative to the species observed during a residence there in the summer of 1840. Several additions to his list are here noticed, and a few errors corrected—errors which the state of British Zoology at the time he wrote rendered altogether unavoidable.

Before proceeding further, it may be proper to mention that I was landed in Skye in the end of April 1840, was conveyed to North Uist, which I crossed, and established myself in Berneray, a small island in the sound of Harris. From this central point, excursions, sometimes of several days' duration, were repeatedly made to all the neighbouring islands, to Harris, the southern portion of which was traversed in all directions, and to North Uist. On the 29th of June I left for St. Kilda†, and was absent eight days; on my return I set off for South Uist, traversing Benbecula, and remaining upwards of a week. On my return I again visited Harris and the adjacent isles, spent some time in North Uist, and finally crossing to Skye in the end of August, walked through the west highlands to Edinburgh, which I reached after an absence of four months.

MAMMALIA.

The Otter, *Lutra vulgaris*, is sparingly distributed along the whole of the rocky coasts of the Hebrides. It is found chiefly among the loose blocks of stone by the shore, but occasionally frequents the inland lakes, especially in South Uist. The otters of the Hebrides belong exclusively to the dark variety, considered by Mr. Ogilby as specifically distinct, which, though said to be smaller than the other, is yet not always so; for one shot in the island of Vallay measured five feet, and another seen at Scolpig about nine inches less, being still above the average size. *Phoca vitulina*, Common Seal, is extremely abundant in the sound of Harris and the neighbouring inlets of North Uist, but less so elsewhere. The young are born about the beginning of June, and immediately follow their mother. One only is usually produced at a birth,

* Edinb. Journ. of Nat. and Geograph. Science, vol. ii. pp. 161 and 321.

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but in a single instance two cubs were observed following one female. During a storm I have seen them throwing themselves forwards, half out of the water, which movement they repeated several times in succession. Two individuals of *Phoca grælandica*, Harp or Greenland Seal, were observed by Mr. D. MacLellan and myself, on a small rock in the Atlantic, off the west coast of South Uist, in the month of July. They were seen through a telescope, at a distance of not more than 300 yards, as we were watching the strange movements of a large schooner which sunk in deep water a few minutes afterwards. Being then in the habit of daily seeing numbers of seals, I could scarcely have mistaken so marked a species for either of the two others. *Halichærus griseus*, Nilss., Great Seal, as determined by me from the examination of several individuals, also of two crania, and numerous skins, is equally plentiful with the Common Seal, from which it differs greatly in habits. It seldom enters the shallow sounds like the *Ph. vitulina*, with which it never associates, but frequents the open sea, upon the western or Atlantic coasts of the islands, where alone I have observed it. It breeds in November, leaving its young one upon the rock, and suckling it at each tide. The most noted places of resort of this species are the rocky islands of Haskir, twelve miles off the west coast of North Uist, and Gaskir, at a similar distance from the Harris coast. In the beginning of November a large boat filled with men leaves North Uist under night, and generally arrives at Haskir soon after daybreak. The men land upon the island armed with long clubs and separate into two bodies, one of which attack the seals upon the shelving rocks upon which they are found lying with their cubs, while the other cut off their retreat to the water. A short but fierce struggle then takes place; a few of the animals escape, the rest are killed by repeated blows about the root of the nose, their only vulnerable spot, and the rock is soon covered with the dying and the dead. About seventy are thus annually procured, but the number varies considerably, as many as 120 having sometimes been obtained. Many of them are of large size, one which I measured at Vallay being $7\frac{1}{2}$ feet in length, exclusive of the head, and individuals of much larger size are not unfrequently met with.

Mus Musculus, Common Mouse, is of common occurrence: *M. decumanus*, the Brown Rat, was observed to feed on shellfish and crustacea in the uninhabited islands of the sound of Harris, the sea-banks of many of which I have seen perforated in all directions with their burrows.

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The Red Deer, *Cervus Elaphus*, of the Outer Hebrides is much smaller than individuals from the mainland of Scotland. By being carefully preserved, the deer are still plentiful in the forest of Harris and the interior of North Uist; in the latter situation they betake themselves to the water on being pursued, and easily find shelter among the numerous islets of the lakes.

Various Cetacea were occasionally seen during my numerous boating excursions, both in the Minch and upon the west coast; but the only species, besides the Porpoise, *Delphinus Phocæna*, that I could identify is the Grampus, *D. Orca*, conspicuous by its peculiar dorsal fin. On the beach at Pabbay may be seen numerous gigantic bones, the remains of a drove of eighty grampuses which were driven ashore by the islanders about twenty-five years ago.

BIRDS.

The two species of Eagles, *Aquila Chrysaëtos* and *Haliaëtus albicilla*, were occasionally observed, the latter by far the most frequently. As the eyries are well known in their respective neighbourhoods, and a reward offered for the destruction of both old and young, the number of these birds is annually diminishing. The Sea Eagle, though usually building upon the maritime cliffs, in one instance was found breeding on a small flat islet in one of the numerous lakes of North Uist, and two eggs were procured from the locality in question. When sitting on the grass upon the summit of Ben Mhore in South Uist, a magnificent bird of this species alighted on a neighbouring pinnacle, which I had previously observed to be strewn with its down and feathers. I crawled to within a few yards of the spot, and with a telescope leisurely examined the noble bird, as he stood erect and almost motionless, occasionally casting quick glances all around; on being disturbed he quickly unfolded his broad wings, launched into the mist below, and was soon lost to view. It being a Sunday I had no gun with me, else I could easily have procured him, but the fine sight made ample amends for my disappointment. The only breeding-place of the Golden Eagle visited by me, was an isolated promontory stretching far into the Atlantic, and forming the hill of Northtown. Before reaching the spot I had unfortunately scared away the eagles by firing at some cormorants upon the rocks, and had to content myself with a distant view. An uncle of mine, who for a long time resided in the neighbourhood, was in the habit of occasionally descending into their eyrie by means of a rope, and in this way took many eggs and destroyed several

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young birds. One of the old birds was also shot by my father from a covered pit in which he lay concealed, the bird being enticed by a hen fastened by a string at a little distance.

Falco peregrinus, the Peregrine Falcon, breeds in St. Kilda, and I believe in various other localities, and was occasionally observed in several of the islands. In the end of July, while crossing the moors of North Uist on horseback along with three companions, a male Peregrine flew past us with a *Lestris Richardsonii* in its talons, and another, probably the mate of the murdered bird, in hot pursuit, uttering incessant cries. A splendid specimen of the Jer Falcon, *F. islandicus*, was shot in North Uist a few years ago by my friend D. Arbuckle, Esq., and another was seen in the adjacent island of Pabbay by Mr. Nicholson (Berneray), but was not procured. *F. Tinnunculus*, Kestrel, occurred not unfrequently; *F. Æsalon*, the Merlin, once or twice; and the Hen Harrier, *Circus cyaneus*, was rather abundant, especially among the bogs of the two Uists, where it breeds.

Hirundo rustica is the only species of Swallow that I met with in the Hebrides, where it did not arrive till the end of June. About a dozen were observed at the landing-place of Pabbay on the morning of my departure for St. Kilda; and a single individual had been caught alive in the school-house of Berneray and brought to me a few days before. That rare bird the Hoopoe, *Upupa Epops*, extends its occasional visits to the Hebrides; for I was informed by my friend Dr. M'Leod of a bird previously unknown in that part of the country, which, from description, was immediately recognised as the species now mentioned. An individual was found in an exhausted state lying by the road-side near Balelone in North Uist, after a long-continued easterly gale, and died shortly afterwards.

The Wren, *Troglodytes europæus*, is pretty common; the Robin, *Erythacus Rubecula*, and Hedge Chanter, *Accentor modularis*, occurred only in the glen of Rhodil, where alone, in all the Outer Hebrides, is there wood in any quantity. Of *Saxicola Rubetra*, Whinchat, a solitary pair was observed at Ob in Harris, where the nest was found; *S. Œnanthe*, the Wheatear, arrived in the beginning of May (in Skye about the end of April), and soon became very abundant throughout the range. I have sometimes found as many as three or four nests in the walls of a single hut. A nest of the Redwing, *Turdus iliacus*, was found by Mr. Bullock many years ago in the glen of Rhodil; but although I visited the spot repeatedly, I failed in again meeting with the bird. The Song Thrush, *T. musicus*, is plentiful everywhere, and identical with speci-

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mens from the south, although eggs brought by me from Harris are certainly smaller and darker than usual, and the nest is different. The Common and Shore Pipits, *Anthus pratensis* and *aquaticus*, are both common; the nest of the latter I have frequently found at a distance from the sea.

The Raven, *Corvus Corax*, is generally distributed, but is nowhere numerous, unless when attracted by a stranded whale or drove of grampuses. Although it generally builds in lofty rocks overhanging the sea, from which I have taken the young, yet I know of a nest in the island of Berneray at an elevation of certainly not more than fifteen feet, but still quite inaccessible from above, and nearly so from below. The owners of this nest made great havoc among the poultry in the neighbourhood, and I have known one of them to kill a full-grown duck and partially devour it. *C. Cornix* was the only other species noticed, though both *C. Corone* and *C. frugilegus* are met with in Skye. The Hooded Crow is very plentiful, especially in St. Kilda, and, like the Raven, approaches the huts early in the morning, searching the dunghills for offal of every kind. It lives chiefly on shell-fish and crustacea; but when in South Uist in the end of July, I daily observed large flocks of this bird feeding on the larvæ bred in the putrid sea-weed collected into small heaps for manure. In the Hebrides it breeds in rocks, chiefly maritime; but in the neighbouring island of Skye, I have taken the nest in a tree by the roadside, at the head of Loch Snizort. The Starling, *Sturnus vulgaris*, is very common, beginning to collect into large flocks in July, and remaining thus till the end of April.

Fringilla domestica, the Common Sparrow, I found in only a single locality—among the ruins of Ormaclate Castle in South Uist, of old the family-seat of Clanranald; *F. cælebs*, the Chaffinch, occurred only in the glen of Rhodil, along with *Coccothraustes Chloris*, the Greenfinch. *Linota Montium*, the Twite, is abundant, and the only Hebridian species of the genus. *Emberiza Miliaria*, the Corn Bunting, is plentifully distributed over the whole range; *E. Schœniclus*, Reed Bunting, is rare, and *E. Citrinella*, Yellow Bunting, was seen only at Rhodil. *Plectrophanes nivalis*, Snow Bunting, I found so late as the middle of May, when I shot a pair on the sand-hill of Berneray. The Skylark, *Alauda arvensis*, is common.

Cuculus canorus, the Cuckoo, was seen and heard occasionally, especially in North Uist, about Loch Maddy, and elsewhere. The Rock Dove, *Columba Livia*, breeds in great numbers in the maritime caves and fissures, and nowhere more abundantly than in the island of Pabbay. During summer its food consists almost entirely of *Helix ericetorum* and

mens from the south, although eggs brought by me from Harris are certainly smaller and darker than usual, and the nest is different. The Common and Shore Pipits, *Anthus pratensis* and *aquaticus*, are both common; the nest of the latter I have frequently found at a distance from the sea.

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Bulimus acutus, shells very abundant among the sandy pastures.

The Red Grouse, *Lagopus scotticus*, is abundant; and the Ptarmigan, *L. cinereus*, occurs sparingly upon Ben Mhore and Hecla in South Uist, and Ronaval in Harris, but more plentifully upon the summits of the Forest Hills. A single individual was seen in St. Kilda a few winters ago by the minister, who informed me of the circumstance, which seems almost incredible, the nearest land being fifty miles distant, from which it looks a mere speck upon the ocean. Yet birds apparently less capable of enduring continued flight, as the Corncrake and Wheatear, annually visit St. Kilda.

Charadrius Hiaticula, the Ringed Plover, is very plentiful, as is also *C. pluvialis*, Golden Plover; the latter congregates into vast flocks about the end of July, which betake themselves to the shore at low water; and I have seen the "ebb" of Berneray, a curious reef of bare-stones extending upwards of a mile, in many places completely covered with their dense masses. *Vanillus cristatus*, the Lapwing, is very abundant in several of the islands, as Ensay, Killigray, and Toroway, as well as the two Uists and Benbecula. The Oyster Catcher, *Hæmatopus ostralegus*, is plentifully distributed, breeding in almost every maritime situation, as well as by the inland lakes; the nest varies considerably, according to the locality. It is extremely probable that the Turnstone, *Strepsilas collaris*, breeds in the Hebrides, at least occasionally; for I have seen it in pairs so late as the middle of June in the island of Ensay, and shot it in the end of July and beginning of August upon the reef of Berneray. *Numenius arquata*, the Curlew, is common, but I did not find it breeding; *N. Phæopus*, the Whimbrel, was first seen on the 2nd of May, and had disappeared by the end of the month, hence the vernacular name of May-fowl. It is very plentiful, and usually met with in small flocks of about twenty or so, and on its arrival is very tame, but soon becomes more wary. It chiefly frequents the pastures, but occasionally resorts to the shore at low water; none remain to breed, for I never heard of any being seen after the end of May. *Tringa variabilis*, the Dunlin, is very common, leaving the coast for the heaths in May, and returning in the end of July along with the young of the year. The Sanderling, *Calidris arenaria*, I have observed so late as the middle of May; hence it may possibly breed in some part of the district. *Totanus hypoleucos*, Common Sandpiper, occurs by the margins of most of the lakes, where it breeds. *T. Calidris*, the Redshanks, was shot in Berneray in the end of May, and found in pairs on the island of Toroway in June, and at Vall-

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Anser brachyrhynchus, the Pink-footed or Short-billed Goose, breeds in great numbers in the small islands of the sound of Harris, as well as those of the interior of North Uist. This bird was seen in flocks so late as the beginning of May, was observed in pairs among the islands in the sound about the middle of the month, and had the young fully fledged and strong upon wing about the end of July; it had again collected into flocks by the beginning of August, for late in the night of the 8th of that month, as I was riding in great haste to overtake the ferry-boat for Berneray, while crossing the sandy margin of a shallow pool, I came suddenly upon a flock of geese amounting to several hundreds, judging from their cries, which startled my horse, and I may add, myself also. A large flock of Brent Geese, *Bernicla Brenta*, passed over head from the southward on the 2nd of May, while I was engaged collecting crustacea on the reef at Berneray: this is the latest date of their occurrence, for I could never hear of any remaining to breed. *Tadorna Vulpanser*, the Shieldrake, breeds in all the islands of the sound of Harris, with the exception of Berneray, Pabbay, and Shellay, and is plentiful in many parts of Benbecula and the two Uists. The eggs at first have a slight tinge of pink, which they soon lose. *Anas*

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Boschus, Mallard, is not uncommon; and the Seal, *Querquedula Crecca*, has been known to breed in South Uist, but I never observed it there. The Eider Duck, *Somateria mollissima*, breeds in small numbers on some of the less frequented islets of the sound of Harris, as Skerry-vore, Shellay, and those between Killigray and Ob. The island of Haskir is the chief breeding-place of this bird, the numbers there found being represented as truly astonishing. *Harelda glacialis*, the Long-tailed Duck, was observed in pairs in the sound of Harris so late as the beginning of May, but none remained during the summer.

The Goosander, *Mergus Castor*, is pretty common, breeding by the larger lakes and occasionally by the sea, as near Loch Maddy in North Uist. *M. Serrator*, the Red-breasted Merganser, I have seldom observed inland, like the preceding; a few remain during the summer, and I took the nest with eggs on a small island between Killigray and Ob, in the sound of Harris. The Cormorant, *Phalacrocorax carbo*, is rather plentiful, breeding along with the next in St. Kilda, Shellay, and Towhead. *P. cristatus*, the Shag, is much more plentiful than the last, and may be found in most of the maritime caves, where it is so tame that I have several times seen them killed with stones thrown from above. Among many which I shot at Northtown, beside a cave which in days of old sheltered for a time one of the fugitives from Culloden, Mr. M'Leod of Berneray has one of a light brown colour: this being in the month of June, it could not be one of the young birds of the year, which are well known to have their first plumage of that colour. The Gannet, *Sula Bassana*, may be seen coasting along the headlands and entering the bays with the first dawn of morning, and retiring in the evening in long strings towards St. Kilda, where alone it breeds. When gorged with fish it is sometimes scarcely able to raise itself from the water, and I have seen it taken by the hand when asleep in this state. The Common Tern, *Sterna Hirundo*, was first observed on the 14th of May, and found breeding a few days after in company with the Arctic Tern, *St. arctica*, which is much more plentiful. On several of the smaller and less frequented islands on which I landed, many hundreds of their eggs were taken in a few minutes, and in some places one could hardly move without treading upon them; a loose cloud of terns of both species hovering about uttering incessant cries, and darting down to within a few feet of the invaders of their peaceful territory. The Laughing Gull, *Xema ridibundum*, is abundant in the marshes of the two Uists and Benbecula, also near Rhodil and in Berneray, breeding in all these situ-

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ations. *Rissa tridactyla*, the Kittiwake, breeds only in Haskir and St. Kilda; in the latter place in large colonies. *Larus marinus*, the Great Black-backed Gull, is plentiful; its nest was found only on the small island of Shellay, at Lowhead, and in the interior of North Uist, among the small lakes. *L. fuscus*, the Lesser Black-backed Gull, is not so common as the others of the genus, but was found breeding in the same places as the preceding. Large colonies were noticed on several of the islets of North Uist, upwards of a mile from the sea. *L. canus* and *L. argentatus*, the Common and Herring Gulls, were equally abundant; the latter was never found breeding in the interior as the former occasionally was. *Lestris Richardsonii*, Richardson's Skua, breeds in several spots in the interior of North Uist, and a few stragglers might now and then be observed upon the coasts, chasing the terns and smaller gulls. The Fulmar, *Procellaria glacialis*, breeds in astonishing numbers upon the terrific cliffs of St. Kilda, but was not observed elsewhere, except when at sea in very gloomy weather; also in the evening and at daybreak, when I have seen them following in the wake of the boat, but seldom for any time. In St. Kilda I have taken them alive upon the rocks, but never observed them eject oil from their nostrils, as mentioned in ornithological works, though they vomit that fluid most copiously on being wounded or roughly handled. Such as I dissected had the stomach filled with clear oil, mixed with the horny mandibles of some *Sepiada*, on which, and not the "flesh of whales," as stated in books, the St. Kilda Fulmar may be presumed to subsist. *Puffinus Anglorum*, the Shearwater, was seen occasionally at sea, but on land only in St. Kilda, where it nestles in excavations formed by itself: like the next, it seems to be in great measure a nocturnal bird. The Stormy Petrel is extremely plentiful about St. Kilda, whence it issues about an hour before sunset: as to the species I am not quite certain, as I did not procure a single specimen; for although they sometimes came about the boat in great numbers, this happened only in very rough weather, when, as every one who has faced the Atlantic in an open boat during a heavy gale will readily imagine, shooting was rendered exceedingly difficult, and picking up the dead birds next to impossible.

The Dobchick, *Podiceps minor*, occurred in almost all the lakes of North and South Uist. The Eared Grebe, *P. auritus*, in the latter only, chiefly about Ormaclate. The Northern Diver, *Colymbus glacialis*, was plentiful until the beginning of June, when they all disappeared, and had not again returned when I left the country. *C. septentrionalis*, the Red-throated Diver, was observed on several of the lakes; and *C.*

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IV.—*Researches on the Structure of Annular Vessels.*

By HUGO MOHL†.

[With a Plate.]

DR. SCHLEIDEN lately published some observations on the spiral formations in the cells of plants in the 'Flora' (see *Annals and Mag. of Nat. Hist.*, vol. vi. p. 35), which interested me the more by reason of my having recently directed attention to the same subject (*Flora*, 1839, pp. 81–142), and especially as the result of his researches coincided with my own in all essential points concerning the structure of the cellular membrane of vegetables. His opinion principally differs from mine in two points, viz. the order of development of the secondary membranes and fibres in the woody fibre of *Taxus* and allied organisms, and the formation of the annular vessels.

I must wait for a more favourable opportunity to examine the first point; but, as regards the second, I will state the reasons which induce me to adhere to my former opinion, notwithstanding Schleiden has set forth a new theory respecting the development of the annular vessels.

Long ago (see 'Flora,' 1838, p. 378,) have I been opposed to the hypothesis, which is devoid of all foundation, although generally received even in the present day, that annular vessels owe their origin to the disruption of the spiral fibres of spiral vessels whose fragments become afterwards united in the form

* Where I procured a nearly white variety of this species.

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